

CLAIMS:

WHAT IS CLAIMED IS:

1. A display supporting apparatus, comprising:
 - an upper engaging part mountable on a ceiling;
 - a swivel adjusting part rotatably combined with a bottom of the upper engaging part;
 - a flange member combined with the upper engaging part to support the swivel adjusting part;
 - a first engaging pipe extended downward from the swivel adjusting part; and
 - a display mounting part combined with a bottom of the first engaging pipe to mount a display thereon.
2. The display supporting apparatus according to claim 1, wherein the upper engaging part comprises:
 - a mounting plate provided with a plurality of first engaging holes to mount on the ceiling;
 - a trunk part having a hollow projection, to project from a center part of the mounting plate and having on the bottom thereof, at least one pair of second engaging holes to couple to the flange member; and
 - a supporting rib combined with the mounting plate and the trunk part to support a weight of the display.
3. The display supporting apparatus according to claim 2, wherein the swivel adjusting part comprises:

a plate provided to withstand the weight of the display and with a through hole having a diameter equal to an external diameter of the trunk part of the upper engaging part; and an engaging part bent downward from an edge of the plate, and being provided with at least one pair of engaging holes to couple to the first engaging pipe.

4. The display supporting apparatus according to claim 3, wherein the flange member comprises:

a trunk part having a hollow inside, an external diameter to correspond to an internal diameter of the trunk part of the upper engaging part and provided with at least one pair of engaging holes to couple to the trunk part of the upper engaging part; and a flange projected from the bottom of the trunk part of the upper engaging part to support the swivel adjusting part.

5. The display supporting apparatus according to claim 4, wherein:
the trunk part of the flange member comprises a male screw on a top outside thereof, and
the trunk part of the upper engaging part comprises a female screw on a bottom inside thereof to correspond to the male screw.

6. The display supporting apparatus according to claim 5, wherein the trunk part of the flange member is provided with a flat face on the male screw on which an engaging pin passing through the second engaging hole of the upper engaging part is seated.

7. The display supporting apparatus according to claim 5, wherein the first engaging pipe comprises:

a trunk part having a hollow inside and an external diameter to correspond to an internal diameter of the engaging part of the swivel adjusting part;

at least one pair of first engaging holes provided on a top of the trunk part to couple to the engaging part of the swivel adjusting part; and

at least two pairs of second engaging holes provided on the bottom of the trunk part to couple to the display mounting part.

8. The display supporting apparatus according to claim 7, wherein the trunk part of the first engaging pipe comprises a male screw on the top thereof to enhance a force of coupling the trunk part to the swivel adjusting part, and

the engaging part of the swivel adjusting part comprises a female screw on an inside thereof to correspond to the male screw of the first engaging pipe.

9. The display supporting apparatus according to claim 8, wherein the first engaging pipe is provided with an external diameter smaller than the internal diameter of the engaging part of the swivel adjusting part, which has an internal diameter within which the female screw corresponding to the male screw of the first engaging pipe is provided.

10. The display supporting apparatus according to claim 9, further comprising:

a nut having an internal diameter to provide therein a female screw to correspond to the male screw of the first engaging pipe, and an external diameter to provide a male screw to correspond to the female screw of the swivel adjusting part.

11. The display supporting apparatus according to claim 10, wherein the display mounting part comprises:

a mounting plate provided with a plurality of first engaging holes to couple to the first engaging pipe; and

left and right engaging parts respectively having a plurality of second engaging holes to mount the display.

12. The display supporting apparatus according to claim 6, wherein the first engaging pipe comprises:

a trunk part having a hollow inside and an external diameter to correspond to an internal diameter of the engaging part of the swivel adjusting part;

at least one pair of first engaging holes provided on a top of the trunk part to couple to the engaging part of the swivel adjusting part; and

at least two pairs of second engaging holes provided on the bottom of the trunk part to couple to the display mounting part.

13. The display supporting apparatus according to claim 12, wherein:
the trunk part of the first engaging pipe comprises a male screw on the top thereof, to enhance a force of coupling the trunk part to the swivel adjusting part, and

the engaging part of the swivel adjusting part comprises a female screw on an inside thereof to correspond to the male screw of the first engaging pipe.

14. The display supporting apparatus according to claim 13, wherein the first engaging pipe is provided with an external diameter smaller than the internal diameter of the engaging part of the swivel adjusting part, which has an internal diameter within which a female screw corresponding to the male screw of the first engaging pipe is provided.

15. The display supporting apparatus according to claim 14, further comprising: a nut having an internal diameter to provide therein a female screw to correspond to the male screw of the first engaging pipe, and an external diameter to provide a male screw to correspond to the female screw of the swivel adjusting part.

16. The display supporting apparatus according to claim 15, wherein the display mounting part comprises:

a mounting plate provided with a plurality of first engaging holes to couple to the first engaging pipe; and

left and right engaging parts respectively having a plurality of second engaging holes to mount the display.

17. The display supporting apparatus according to claim 1, further comprising:

a second engaging pipe having an external diameter to correspond to an internal diameter of the first engaging pipe, and provided with a trunk part having a hollow inside to couple to the first engaging pipe;

at least one pair of first engaging holes to couple to the bottom of the first engaging pipe; and

at least two pairs of second engaging holes on the bottom of the trunk part to couple to the display mounting part, wherein the second engaging pipe is configured to adjust the height of the display.

18. The display supporting apparatus according to claim 17, further comprising:

a third engaging pipe having an external diameter and internal diameter to correspond to the external and internal diameters of the first engaging pipe, and provided with a trunk part having a hollow inside to couple to the second engaging pipe;

at least one pair of first engaging holes on a top thereof to couple to a bottom of the second engaging pipe; and

at least two pairs of second engaging holes provided on the bottom of the trunk part to couple to the display mounting part, wherein the third engaging pipe is configured to adjust the height of the display.

19. The display supporting apparatus according to claim 18, provided on the bottom of one of the first through third engaging pipes, the display supporting apparatus further comprising:

a tilt adjusting part provided so that at least one of the first, second, and third engaging pipes is coupled thereto, and to couple to the display mounting part.

20. The display supporting apparatus according to claim 19, wherein the tilt adjusting part comprises:

a plate provided with a first engaging hole to couple the plate to the display mounting part; and

bent parts provided on opposite sides of the plate, having a plurality of second engaging holes to couple to at least one of the first, second, and third engaging pipes, and a third engaging hole to couple to the at least one of the first, second, and third engaging pipes, allowing tilt adjustment of the display.

21. The display supporting apparatus according to claim 20, wherein the third engaging pipe is inserted between the bent parts of the tilt adjusting part.

22. The display supporting apparatus according to claim 21, wherein the second engaging holes of the bent parts are provided to adjust a tilting of the display at a predetermined angle.

23. The display supporting apparatus according to claim 2, wherein a force to support the display is enhanced as a number of the second engaging holes of the upper engaging part is increased.

24. The display supporting apparatus according to claim 4, wherein a swiveling of the display is performed based on a contact between the flange of the flange member and the plate of the swivel adjusting part.

25. The display supporting apparatus according to claim 4, wherein the upper engaging part is positioned so that the second engaging holes of the upper engaging part correspond to the engaging holes of the flange member to be engaged with engaging pins.

26. The display supporting apparatus according to claim 7, wherein the first engaging pipe is positioned so that the first engaging holes of the first engaging pipe corresponds to the engaging holes of the swivel adjusting part to be engaged with engaging pins.

27. The display supporting apparatus according to claim 11, wherein the second engaging holes provided on the bottom of the first engaging pipe are positioned to correspond to the first engaging holes of the display mounting part to be engaged with engaging pins.

28. The display supporting apparatus according to claim 17, wherein the second engaging pipe is inserted into the first engaging pipe to reduce a weight of the second engaging pipe.

29. A display mounted on the display supporting apparatuses according to claim 1.

30. A display supporting apparatus to support a display, comprising:

an upper engaging part mounted on a ceiling;
a swivel adjusting part rotatably combined with a bottom of the upper engaging part;
a flange member combined with the upper engaging part to support the swivel adjusting part;
first, second, and third engaging pipes extendable relative to each other downward from the swivel adjusting part; and
a display mounting part to couple to a bottom of at least one of the first, second, and third engaging pipes to mount the display thereon.

31. A display supporting apparatus to support a display, comprising:
an upper engaging part mounted on a ceiling;
a swivel adjusting part rotatably combined with a bottom of the upper engaging part;
a flange member combined with the upper engaging part to support the swivel adjusting part; and
a first engaging pipe extended downward from the swivel adjusting part, wherein the display is directly mounted on the first engaging pipe.

32. A display supporting apparatus to support a display, comprising:
an upper engaging part mounted on a ceiling;
a swivel adjusting part rotatably combined with a bottom of the upper engaging part;
a flange member combined with the upper engaging part to support the swivel adjusting part; and
first, second, and third engaging pipes extendable relative to each other downward from

the swivel adjusting part, wherein the display is coupled to at least one of the first, second, and third engaging pipes.